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Standard for signal and test definition

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## CONTENTS

FOREWORD.....	10
IEEE introduction.....	13
1. Overview.....	14
1.1 Scope.....	14
1.2 Purpose.....	15
2. Definitions, abbreviations, and acronyms.....	15
2.1 Definitions .....	15
2.2 Abbreviations and acronyms .....	17
3. Structure of this standard .....	18
3.1 Layers.....	18
4. Signal modeling language (SML) layer.....	20
5. Basic signal component (BSC) layer .....	20
5.1 BSC layer base classes.....	20
5.2 BSCs .....	21
5.3 SignalFunction template .....	22
6. Test signal framework (TSF) layer .....	22
6.1 TSF classes .....	22
6.2 TSF signals .....	23
7. Test procedure language (TPL) layer .....	25
7.1 Goals of the TPL.....	25
7.2 Elements of the TPL .....	25
7.3 Use of the TPL.....	25
Annex A (normative) Signal modeling language (SML) .....	26
A.1 Use of the SML.....	26
A.2 Introduction.....	26
A.3 Physical types .....	27
A.4 Signal definitions .....	30
A.5 Pure signals .....	31
A.5.1 Nonperiodic signals.....	31
A.5.2 Periodic signals .....	32
A.6 Pure signal-combining mechanisms .....	33
A.6.1 Piecewise continuous signals (PCSs).....	33
A.6.2 Sum.....	36
A.6.3 Product .....	36
A.7 Pure function transformations.....	36
A.7.1 Fourier transform.....	37
A.8 Measuring, limiting, and sampling signals .....	37
A.8.1 Confining parameters to a limit.....	38
A.8.2 Sampling signals .....	38
A.9 Digital signals .....	38

A.9.1	Defining Digital.....	39
A.9.2	Defining DigitalSignal .....	39
A.9.3	Conversion routines.....	40
A.9.4	Patterns .....	41
A.10	Basic component SML.....	42
A.10.1	Source ::SignalFunction .....	42
A.10.2	Conditioner ::SignalFunction .....	44
A.10.3	EventFunction ::SignalFunction.....	47
A.10.4	Sensor ::SignalFunction .....	50
A.10.5	Digital ::SignalFunction .....	50
A.10.6	Connection ::SignalFunction.....	51
Annex B (normative) Basic signal component (BSC) layer.....		53
B.1	BSC layer base classes.....	53
B.2	BSC subclasses .....	53
B.3	Description of a BSC .....	58
B.3.1	Diagrammatic representation of a BSC.....	58
B.3.2	BSC interfaces.....	59
B.3.3	Types of BSCs.....	60
B.3.4	BSC attribute default values.....	61
B.3.5	BSC subclass descriptions.....	61
B.4	Physical class .....	63
B.4.1	Permissible physical types and their units.....	65
B.4.2	Unit prefixes .....	69
B.5	PulseDefns class .....	70
B.5.1	PulseDefn class .....	71
B.6	SignalFunction class .....	71
B.6.1	Source ::SignalFunction .....	72
B.6.2	Conditioner ::SignalFunction.....	80
B.6.3	EventFunction ::SignalFunction.....	94
B.6.4	Sensor ::SignalFunction .....	100
B.6.5	Digital ::SignalFunction.....	106
B.6.6	Connection ::SignalFunction.....	108
Annex C (normative) Dynamic signal descriptions.....		112
C.1	Introduction .....	112
C.2	Basic classes .....	113
C.2.1	ResourceManager.....	113
C.2.2	Signal.....	114
C.2.3	BSCs.....	116
C.3	Dynamic signal goals and use cases .....	118
Annex D (normative) IDL basic components.....		119
D.1	Introduction.....	119
D.2	IDL BSC library.....	119
Annex E (informative) Test signal framework (TSF) for ATLAS .....		161
E.1	Introduction.....	161
E.2	AC_SIGNAL<type: Current   Power   Voltage> .....	161
E.2.1	Definition .....	161
E.2.2	Interface properties.....	162

E.2.3	Notes.....	162
E.2.4	Model description.....	162
E.2.5	Rules.....	162
E.2.6	Example.....	163
E.3	AM_SIGNAL .....	163
E.3.1	Definition .....	163
E.3.2	Interface properties.....	164
E.3.3	Notes.....	164
E.3.4	Model description.....	164
E.3.5	Rules.....	165
E.3.6	Example.....	165
E.4	DC_SIGNAL<type: Voltage   Current   Power> .....	165
E.4.1	Definition .....	165
E.4.2	Interface properties.....	166
E.4.3	Notes.....	166
E.4.4	Model description.....	166
E.4.5	Rules.....	167
E.4.6	Example.....	167
E.5	DIGITAL_PARALLEL .....	168
E.5.1	Definition .....	168
E.5.2	Interface properties.....	168
E.5.3	Notes.....	168
E.5.4	Model description.....	169
E.5.5	Rules.....	169
E.5.6	Example.....	169
E.6	DIGITAL_SERIAL .....	170
E.6.1	Definition .....	170
E.6.2	Interface properties.....	171
E.6.3	Notes.....	171
E.6.4	Model description.....	171
E.6.5	Rules.....	171
E.6.6	Example.....	172
E.7	DME_INTERROGATION .....	172
E.7.1	Definition .....	172
E.7.2	Interface properties.....	173
E.7.3	Notes.....	173
E.7.4	Model description.....	174
E.7.5	Rules.....	174
E.7.6	Example.....	174
E.8	DME_RESPONSE .....	175
E.8.1	Definition .....	175
E.8.2	Interface properties.....	176
E.8.3	Notes.....	177
E.8.4	Model description.....	177
E.8.5	Rules.....	179
E.8.6	Example.....	179
E.9	FM_SIGNAL<type: Voltage   Power   Current> .....	180
E.9.1	Definition .....	180
E.9.2	Interface properties.....	180
E.9.3	Notes.....	180
E.9.4	Model description.....	180
E.9.5	Rules.....	181
E.9.6	Example.....	181
E.10	ILS_GLIDE_SLOPE<type: Voltage   Power> .....	182

E.10.1	Definition .....	182
E.10.2	Interface properties.....	183
E.10.3	Notes.....	184
E.10.4	Model description.....	184
E.10.5	Rules.....	185
E.10.6	Example.....	185
E.11	ILS_LOCALIZER<type: Power   Voltage> .....	186
E.11.1	Definition .....	186
E.11.2	Interface properties.....	186
E.11.3	Notes.....	187
E.11.4	Model description.....	187
E.11.5	Rules.....	188
E.11.6	Example.....	188
E.12	ILS_MARKER .....	189
E.12.1	Definition .....	189
E.12.2	Interface properties.....	190
E.12.3	Notes.....	190
E.12.4	Model description.....	190
E.12.5	Rules.....	191
E.12.6	Example.....	191
E.13	PM_SIGNAL .....	191
E.13.1	Definition .....	191
E.13.2	Interface properties.....	192
E.13.3	Notes.....	192
E.13.4	Model description.....	192
E.13.5	Rules.....	193
E.13.6	Example.....	193
E.14	PULSED_AC_SIGNAL<type: Current   Power   Voltage> .....	194
E.14.1	Definition .....	194
E.14.2	Interface properties.....	194
E.14.3	Notes.....	194
E.14.4	Model description.....	195
E.14.5	Rules.....	195
E.14.6	Example.....	195
E.15	PULSED_AC_TRAIN<type: Voltage   Current   Power> .....	196
E.15.1	Definition .....	196
E.15.2	Interface properties.....	196
E.15.3	Notes.....	197
E.15.4	Model description.....	197
E.15.5	Rules.....	197
E.15.6	Example.....	198
E.16	PULSED_DC_SIGNAL<type: Voltage   Current   Power> .....	198
E.16.1	Definition .....	198
E.16.2	Interface properties.....	199
E.16.3	Notes.....	199
E.16.4	Model description.....	199
E.16.5	Rules.....	200
E.16.6	Example.....	200
E.17	PULSED_DC_TRAIN<type: Voltage   Current   Power> .....	201
E.17.1	Definition .....	201
E.17.2	Interface properties.....	201
E.17.3	Notes.....	201
E.17.4	Model description.....	202
E.17.5	Rules.....	202

E.17.6	Example.....	202
E.18	RADAR_RX_SIGNAL .....	203
E.18.1	Definition .....	203
E.18.2	Interface properties.....	203
E.18.3	Notes.....	204
E.18.4	Model description.....	204
E.18.5	Rules.....	205
E.18.6	Example.....	205
E.19	RADAR_TX_SIGNAL<type: Current   Voltage   Power> .....	206
E.19.1	Definition .....	206
E.19.2	Interface properties.....	206
E.19.3	Notes.....	206
E.19.4	Model description.....	207
E.19.5	Rules.....	207
E.19.6	Example.....	207
E.20	RAMP_SIGNAL<type: Voltage   Current   Power> .....	208
E.20.1	Definition .....	208
E.20.2	Interface properties.....	209
E.20.3	Notes.....	209
E.20.4	Model description.....	209
E.20.5	Rules.....	209
E.20.6	Example.....	210
E.21	RANDOM_NOISE .....	210
E.21.1	Definition .....	210
E.21.2	Interface properties.....	210
E.21.3	Notes.....	211
E.21.4	Model description.....	211
E.21.5	Rules.....	211
E.21.6	Example.....	211
E.22	RESOLVER .....	212
E.22.1	Definition .....	212
E.22.2	Interface properties.....	213
E.22.3	Notes.....	213
E.22.4	Model description.....	213
E.22.5	Rules.....	214
E.22.6	Example.....	215
E.23	RS_232.....	215
E.23.1	Definition .....	215
E.23.2	Interface properties.....	215
E.23.3	Notes.....	216
E.23.4	Model description.....	216
E.23.5	Rules.....	216
E.24	SQUARE_WAVE<type: Current   Voltage   Power> .....	216
E.24.1	Definition .....	216
E.24.2	Interface properties.....	217
E.24.3	Notes.....	217
E.24.4	Model description.....	217
E.24.5	Rules.....	218
E.24.6	Example.....	218
E.25	SSR_INTERROGATION<type: Voltage   Current   Power> .....	219
E.25.1	Definition .....	219
E.25.2	Interface properties.....	219
E.25.3	Notes.....	220
E.25.4	Model description.....	221

E.25.5	Rules .....	221
E.25.6	Example .....	221
E.26	SSR_RESPONSE<type: Voltage   Current   Power> .....	222
E.26.1	Definition .....	222
E.26.2	Interface properties .....	222
E.26.3	Notes .....	223
E.26.4	Model description .....	224
E.26.5	Rules .....	225
E.26.6	Example .....	225
E.27	STEP_SIGNAL .....	226
E.27.1	Definition .....	226
E.27.2	Interface properties .....	226
E.27.3	Notes .....	227
E.27.4	Model description .....	227
E.27.5	Rules .....	227
E.27.6	Example .....	227
E.28	SUP_CAR_SIGNAL .....	228
E.28.1	Definition .....	228
E.28.2	Interface properties .....	228
E.28.3	Notes .....	229
E.28.4	Model description .....	229
E.28.5	Rules .....	230
E.28.6	Example .....	230
E.29	SYNCHRO .....	230
E.29.1	Definition .....	230
E.29.2	Interface properties .....	231
E.29.3	Notes .....	232
E.29.4	Model description .....	232
E.29.5	Rules .....	233
E.29.6	Example .....	233
E.30	TACAN .....	234
E.30.1	Definition .....	234
E.30.2	Interface properties .....	235
E.30.3	Notes .....	236
E.30.4	Model description .....	236
E.30.5	Rules .....	238
E.30.6	Example .....	238
E.31	TRIANGLE_WAVE_SIGNAL<type: Voltage   Current   Power> .....	239
E.31.1	Definition .....	239
E.31.2	Interface properties .....	239
E.31.3	Notes .....	240
E.31.4	Model description .....	240
E.31.5	Rules .....	240
E.31.6	Example .....	240
E.32	VOR .....	241
E.32.1	Definition .....	241
E.32.2	Interface properties .....	242
E.32.3	Notes .....	242
E.32.4	Model description .....	243
E.32.5	Rules .....	244
E.32.6	Example .....	244
Annex F (informative) IDL for TSF for ATLAS .....		245

F.1	Introduction.....	245
F.2	IDL for TSF for ATLAS library.....	245
Annex G (normative) Carrier language requirements .....		265
G.1	Carrier language requirements.....	265
G.1.1	General requirements .....	265
G.1.2	Human interface and communication.....	265
G.2	IDL.....	265
G.3	Data types .....	265
G.3.1	Enumeration data type.....	266
G.3.2	Integer data type .....	266
G.3.3	Real data type .....	266
G.3.4	Character data type.....	267
G.3.5	Boolean data type.....	267
G.3.6	File data type .....	267
G.3.7	Array data type .....	267
G.3.8	Record data type.....	267
G.3.9	Variables and constants .....	267
G.4	Data-processing requirements.....	267
G.4.1	Data manipulation .....	267
G.4.2	Arithmetic operators.....	268
G.4.3	Relational operators.....	268
G.4.4	Logical operators.....	268
G.4.5	Other operators .....	269
G.4.6	Mathematical functions .....	269
G.4.7	File-handling functions .....	269
G.4.8	Type conversion functions .....	270
G.4.9	String related functions .....	270
G.4.10	Other functions .....	271
G.5	Control structures.....	271
G.5.1	If.....	271
G.5.2	Else .....	271
G.5.3	Case .....	271
G.5.4	For .....	271
G.5.5	While .....	271
Annex H (normative) Test procedure language (TPL).....		273
H.1	TPL syntax.....	273
H.2	Elements of the TPL .....	273
H.3	Structure of test requirements .....	273
H.4	Carrier language.....	273
H.5	Signal statements .....	273
H.5.1	Definition of signal statements.....	273
H.5.2	Structure of signal statements .....	274
H.5.3	Syntax of signal statements .....	274
H.6	Mapping of test statements to carrier language .....	275
H.7	Test statement definitions .....	275
H.7.1	Setup statements.....	275
H.7.2	Reset statement.....	283
H.7.3	Connect statement .....	284
H.7.4	Disconnect statement.....	286
H.7.5	Enable statement .....	287

H.7.6	Disable statement .....	288
H.7.7	Read statement .....	289
H.7.8	Change statement .....	290
H.7.9	Compare statement .....	290
H.7.10	Wait_For statement .....	292
H.8	Elements used in test statement definitions .....	292
H.8.1	<TSFClass> .....	292
H.8.2	Attribute-Value groups .....	293
H.9	Attributes with multiple properties .....	300
H.9.1	Entering literal data .....	300
H.9.2	Using arrays of data .....	302
H.9.3	Acquiring sensor data .....	306
H.10	Transferring data in digital signals .....	304
H.10.1	Representation of digital data .....	304
H.10.2	Transmitting digital data using digital sources .....	305
H.10.3	Acquiring digital sensor data .....	307
H.10.4	Bidirectional digital signals .....	307
H.11	Creating test requirements .....	308
H.11.1	Creating test statements .....	308
H.11.2	Use of gate in signal statements .....	309
H.12	Delimiting TPL statements .....	310
H.12.1	Introducing a group of one or more TPL statements .....	310
H.12.2	Indicating end of group of TPL statements .....	310
Annex I (normative)	Extensible markup language (XML) signal descriptions (XSDs) .....	312
I.1	Introduction .....	312
I.2	XML signal schema definition .....	312
Annex J (informative)	XML for TSF for ATLAS .....	350
J.1	Introduction .....	350
J.2	TSF XML schema .....	350
J.2.1	Library information (<TSFLibrary> tag) .....	350
J.2.2	TSF information (<TSF> tag) .....	350
J.2.3	Interface information (<interface> tag) .....	351
J.2.4	Model information (<model> tag) .....	351
J.2.5	XML schema .....	352
J.3	XML for TSF for ATLAS .....	353
Annex K (informative)	Support for ATLAS nouns and modifiers .....	398
K.1	STD support for ATLAS signals .....	398
K.2	STD support for ATLAS nouns .....	398
K.3	STD support for ATLAS noun modifiers .....	401
K.3.1	Example of noun modifier supported by combination of BSCs .....	411
K.3.2	Example of noun modifier supported by a technique .....	411
K.4	Support for ATLAS extensions .....	411
Annex L (informative)	Bibliography .....	412
Annex M (informative)	List of participants .....	413

INTERNATIONAL ELECTROTECHNICAL COMMISSION

STANDARD FOR SIGNAL AND TEST DEFINITION

FOREWORD

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International Standard IEC/IEEE 62529 has been processed through Technical Committee 93: Design automation.

The text of this standard is based on the following documents:

IEEE Std	FDIS	Report on voting
1641(2004)	93/251/FDIS	93/262/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- confirmed,
- withdrawn,
- replaced by a revised edition, or
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## **IEEE Standard for Signal and Test Definition**

Sponsor

**IEEE Standards Coordinating Committee 20 on  
Test and Diagnosis for Electronic Systems**

Approved 2 February 2005

**American National Standards Institute**

Approved 23 September 2004

**IEEE-SA Standards Board**

**Abstract:** This standard provides the means to define and describe signals used in testing. It also provides a set of common basic signals, mathematically underpinned so that signals can be combined to form complex signals usable across all test platforms.

**Keywords:** ATE, ATLAS, automatic test equipment, signal definitions, test definitions, test requirements, test signals, unit under test, UUT

## IEEE Introduction

This standard is the culmination of a radical review of the Abbreviated Test Language for All Systems (ATLAS) and the requirement to create truly portable test requirements. During the review process, it was determined that it would be impractical to revise the existing ATLAS standard to include the required improvements. The decision was made to formulate a new standard to resolve these issues.

The key feature of the signal and test definition (STD) in this standard is the ability to unambiguously define test signals. It includes a rigorous mathematical and definitive foundation for all of its signal components. Any signal defined using this standard will be the same whatever equipment is used to create it. The standard supports the implementation of new technologies by providing users with the ability to describe their own signals by combining existing signals. Thus, any desired signal may be described, and there is no limit on the extensibility of signals supported by this standard.

Signals defined using STD can be used in a programming environment of the user's choice provided that that environment fulfills the minimum requirements stated in this standard. This universality enables the user to take full advantage of modern program structures and development environments, including graphical programming environments.

This standard was developed by the Test Description Subcommittee, whose intention is to prepare a companion guide to explain how to implement signal definitions and test requirements in conformance with STD.

## Notice to users

### Errata

Errata, if any, for this and all other standards can be accessed at the following URL: <http://standards.ieee.org/reading/ieee/updates/errata/index.html>. Users are encouraged to check this URL for errata periodically.

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# STANDARD FOR SIGNAL AND TEST DEFINITION

## 1. Overview

This standard, also known as the signal and test definition (STD) standard, is the culmination of a radical review of the Abbreviated Test Language for All Systems (ATLAS) test programming language and the requirement to create truly portable test requirements. STD will allow test information to pass more freely between the design, test, and maintenance phases of a project, enabling the same information to be used directly across project phases. This more efficient use of information will lead to reduced life-cycle costs.

STD provides the capability to describe and control signals, while permitting a choice of operating environment, including the choice of carrier language. STD permits signal operations to be embedded in any object-oriented environment and thus to be used by the architecture standards of various automatic test systems (ATSS).

Portability is extended beyond that of test specifications by virtue of a layered architecture.

STD defines a collection of objects and their interfaces. These objects describe signal components relevant to test requirements. The STD standard defines how to interconnect these objects using interfaces, through which the objects exchange information, so that a test model may be defined that describes actual test requirements.

Finally, the link to published ATLAS standards (such as IEEE Std 716<sup>TM</sup>-1995 [B9]<sup>1</sup>) is preserved in that the user can describe signal operations using very similar test-signal-related keywords. These keywords now have formal definitions. Furthermore, the parameters of the signals themselves also have a rigorous formal behavioral description.

### 1.1 Scope

This standard provides the means to define and describe signals used in testing. It also provides a set of common basic signals, mathematically underpinned so that signals can be combined to form complex signals usable across all test platforms. The provision of language elements supports test signal descriptions for interoperability.

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<sup>1</sup>The numbers in brackets correspond to the numbers of the bibliography in Annex L.

This standard is divided into seven clauses:

- Clause 1 provides an introduction to this standard.
- Clause 2 provides definitions of terms and lists abbreviations.
- Clause 3 describes the structure of the STD standard.
- Clause 4 specifies the signal modeling language (SML).
- Clause 5 specifies the STD basic signal components (BSCs).
- Clause 6 defines the test signal frameworks (TSFs).
- Clause 7 describes the test procedure language (TPL) layer.

This standard also contains the following annexes:

- a) Annex A provides the Signals Modeling Language that is used to construct the BSCs and the TSFs.
- b) Annex B provides BSC descriptions.
- c) Annex C provides dynamic signal model description, states, and state transitions.
- d) Annex D provides the interface definition language (IDL) description for the BSCs.
- e) Annex E provides a TSF. This framework provides a formal description of signals similar to the signals defined in IEEE Std 716-1995. It also serves to illustrate how complex test signal models can be built up from BSCs.
- f) Annex F provides the IDL description for the TSF provided in Annex E.
- g) Annex G defines the requirements for a carrier language.
- h) Annex H provides the formal TPL description.
- i) Annex I provides the extensible markup language (XML) description mapping signal models into XML descriptions.
- j) Annex J provides XML description mapping the TSF provided in Annex E into XML descriptions.
- k) Annex K provides a description of how ATLAS nouns and noun modifiers are supported by STD.
- l) Annex L provides a bibliography of related documents.